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<input type="checkbox"/>	L8	L7 with heat\$	28
<input type="checkbox"/>	L7	(etching residue)	1665
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<input type="checkbox"/>	L5	L4 or 'heating module'	38475
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<input type="checkbox"/>	L3	6323463.pn.	1
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L1: Entry 1 of 3

File: USPT

Mar 19, 2002

US-PAT-NO: 6358859

DOCUMENT-IDENTIFIER: US 6358859 B1

TITLE: HBr silicon etching process

DATE-ISSUED: March 19, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
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US-CL-CURRENT: 438/712; 257/E21.218, 257/E21.226, 257/E21.312, 257/E21.313,
438/714, 438/719

ABSTRACT:

A method for removing chemisorbed halogens from the surface of a silicon wafer after a plasma etching process is described. The removal takes place before the wafer is unloaded from the etching chamber in order to avoid exposure to atmospheric moisture. Exposure to moisture would cause the discharge of the chemisorbed halogen into the ambient causing corrosion of metal surfaces, particulate formation which reduces product yield, and unsafe halogen levels near the etching tool. The method is particularly useful during silicon etching with HBr where considerable amounts of bromine are chemisorbed onto wafer surfaces. After the etching process is complete, and without breaking vacuum, a carrier gas containing water vapor is flowed over the wafer for a brief time period. The chemisorbed bromine reacts with the water vapor and is converted to HBr which is then purged from the chamber. The embodiments of the invention are described for a single wafer etching tool wherein wafers are loaded and unloaded through a load lock. The water treatment which removes the adsorbed halogens is preferably not conducted in main etching chamber but in a separate chamber. Corrosion of metal surfaces within the load lock and accompanying particle formation is prevented when the chemisorbed bromine is removed before the etched wafer enters the load lock.

22 Claims, 9 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 4

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